Naval Research Laboratory

The Navy and Marine Corps Corporate Laboratory

“GOVERNMENT SHOULD MAINTAIN A GREAT RESEARCH LABORATORY TO DEVELOP GUNS, NEW EXPLOSIVES AND ALL THE TECHNIQUE OF MILITARY AND NAVAL PROGRESSION WITHOUT ANY VAST EXPENSE.”

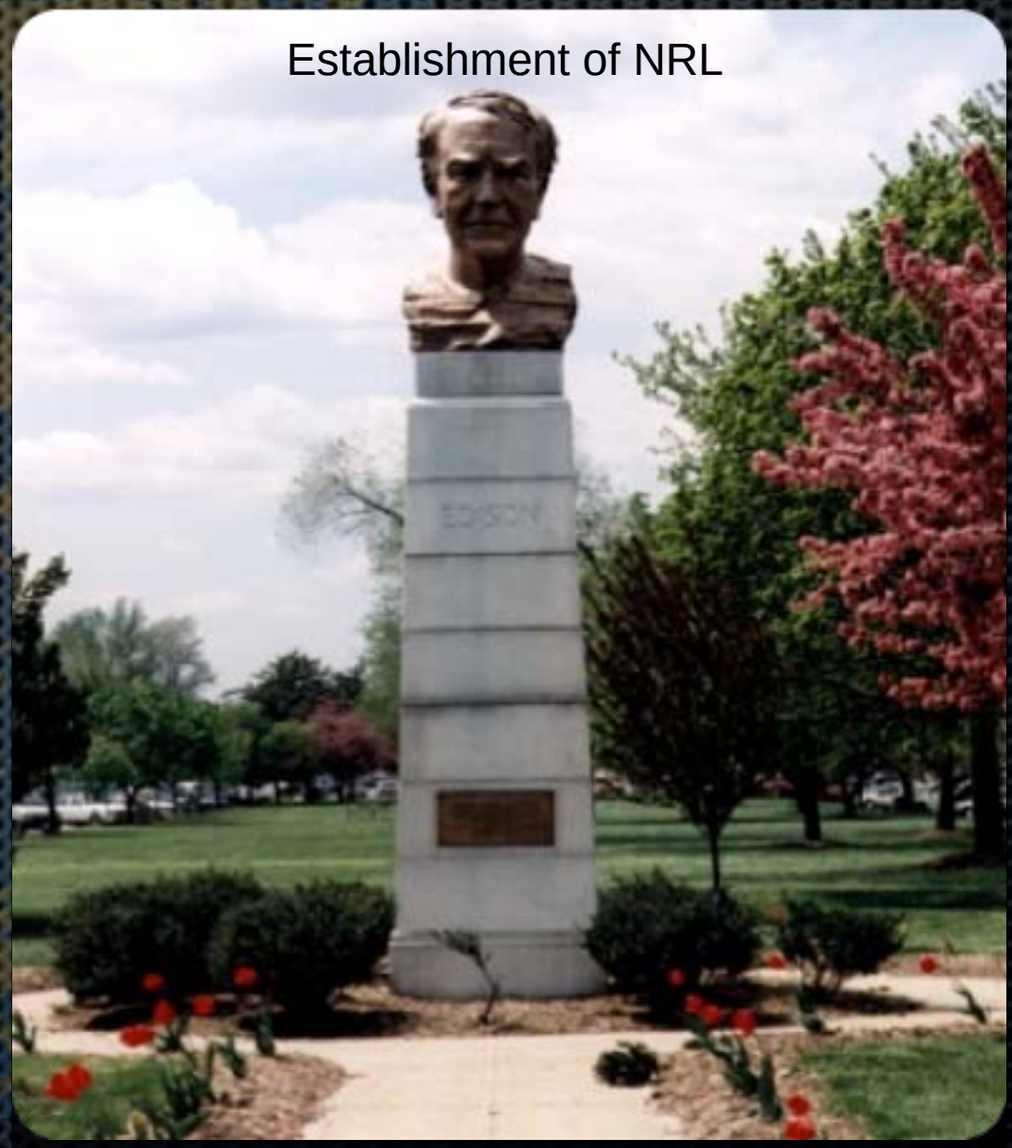
THOMAS A. EDISON

THE NEW YORK TIMES MAGAZINE
SUNDAY, MAY 30, 1915

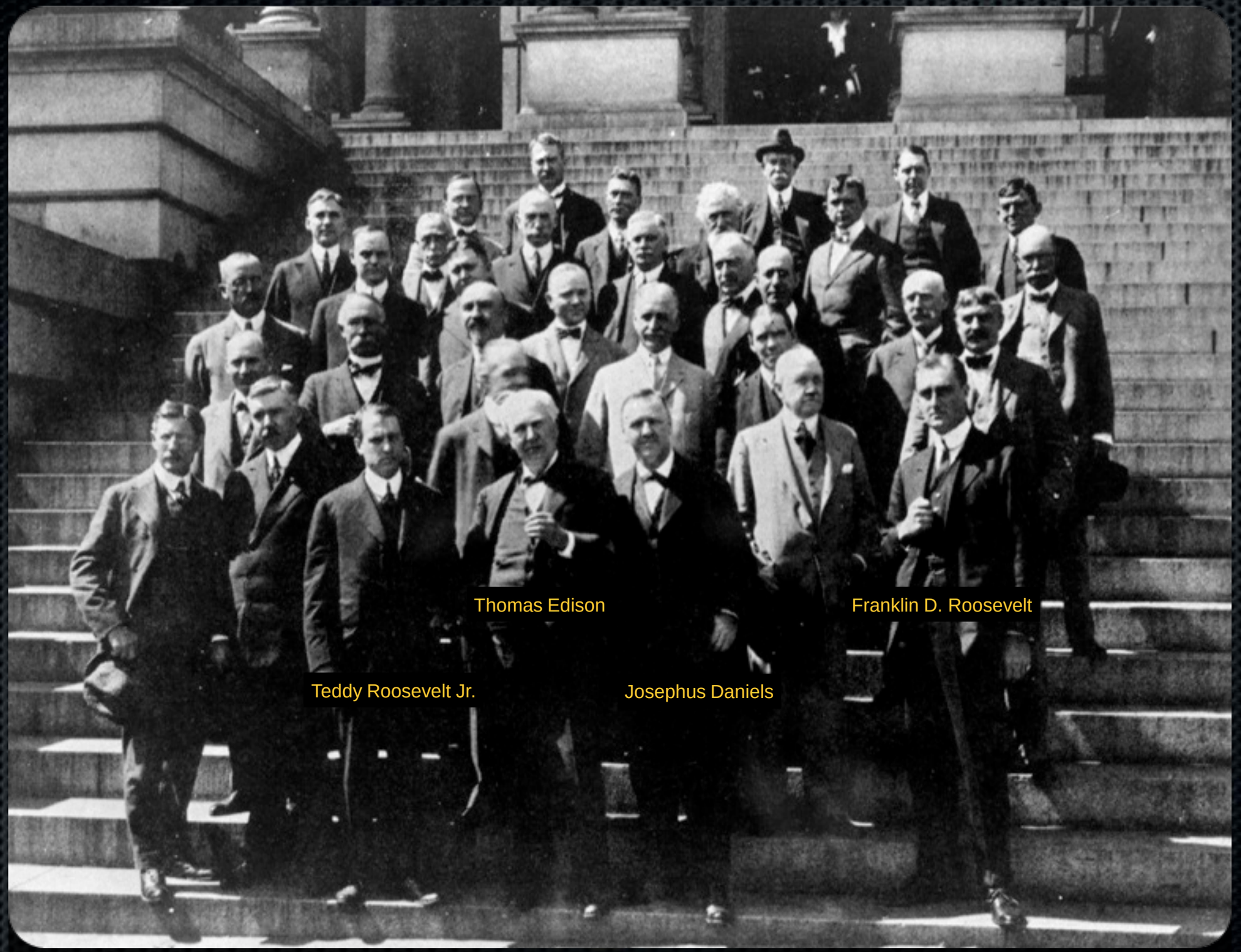
A WORLD-CLASS LABORATORY

- Idea followed the sinking of the Lusitania in 1915
- Secretary Josephus Daniels Established Naval Consulting Board with Edison Chair, meeting October 7, 1915
- August 29, 1916 Congress appropriates funds to establish the Lab
- Delayed by WW-I, Assistant Secretary of the Navy, Theodore Roosevelt, Jr. Commissions the Lab at Bellevue site on July 2, 1923

Establishment of NRL



The Navy and Marine Corps Corporate Laboratory



The Navy and Marine Corps Corporate Laboratory

NRL Mission

- To conduct a broadly based multidisciplinary program of scientific research and advanced technological development directed toward maritime applications of new and improved materials, techniques, equipment, systems and ocean, atmospheric, and space sciences and related technologies.
- Primary in-house research for the physical, engineering, space, and environmental sciences
- Broadly based applied research and advanced technology development program in response to identified and anticipated Navy and Marine Corps needs
- Broad multidisciplinary support to the Naval Warfare Centers
- Space & space systems technology development & support
- Designated as the Navy's corporate laboratory by SECNAV 1991

The Navy and Marine Corps Corporate Laboratory

Lines of Business

- Sensors, Electronics and Electronic Warfare
- Materials/Processes
- Battlespace Environments
- Undersea Warfare
- Information Systems Technology
- Space Platforms
- Technology Transfer

The Navy and Marine Corps Corporate Laboratory

Assistant Secretary of the Navy
(Research, Development & Acquisition)
The Honorable Sean Stackley

Chief of Naval Research
RADM Nevin P. Carr, Jr.

Naval Research Laboratory

Commanding Officer
CAPT. Paul C. Stewart, USN

Director of Research
Dr. John Montgomery

Business Operations
Mr. D. Therning

Systems Directorate
Dr. G. Borsuk

Radar
Electronic Warfare
Optical Sciences
InformationTechnology

Materials Science and Component Technology
Dr. B. B. Rath

Chemistry
Materials Science & Technology
Comp. Phys & Fluid Dynamics
Plasma Physics
Electronics Science & Tech
Biomolecular Science & Engineering

Ocean and Atmospheric Science & Technology
Dr. E. Franchi

Acoustics
Remote Sensing
Oceanography
Marine Geosciences
Marine Meteorology
Space Sciences

Naval Center for Space Technology
Mr. P. G. Wilhelm

Space Systems Dev
Spacecraft Engineering

The Navy and Marine Corps Corporate Laboratory

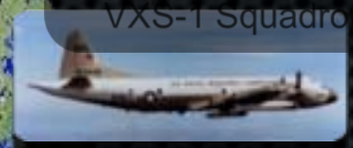
Naval Research Laboratory

Acreage	600+
Buildings	193

Lab Buildings	~$2.5B
Equipment & Facilities	~$1.0B
Replacement Value	**~$3.5B**

MONTEREY, CA

PATUXENT RIVER
VXS-1 Squadron



NRL D.C

Chesapeake Bay Div
Tilghman Is.
Midway Red Ctr
Blossom Point
Pomonkey

* Additional sites based on sponsor research

BAY ST. LOUIS, MS
John C. Stennis Space Center

MOBILE, AL
Ex-USS Shadwell

KEY WEST
Marine Corrosion
Facility

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Research Modified NP-3D	2
AEW Rotodome NP-3D	1
Research Modified RC-12	2
MZ-3A Airship	1
Total Aircraft	**5**

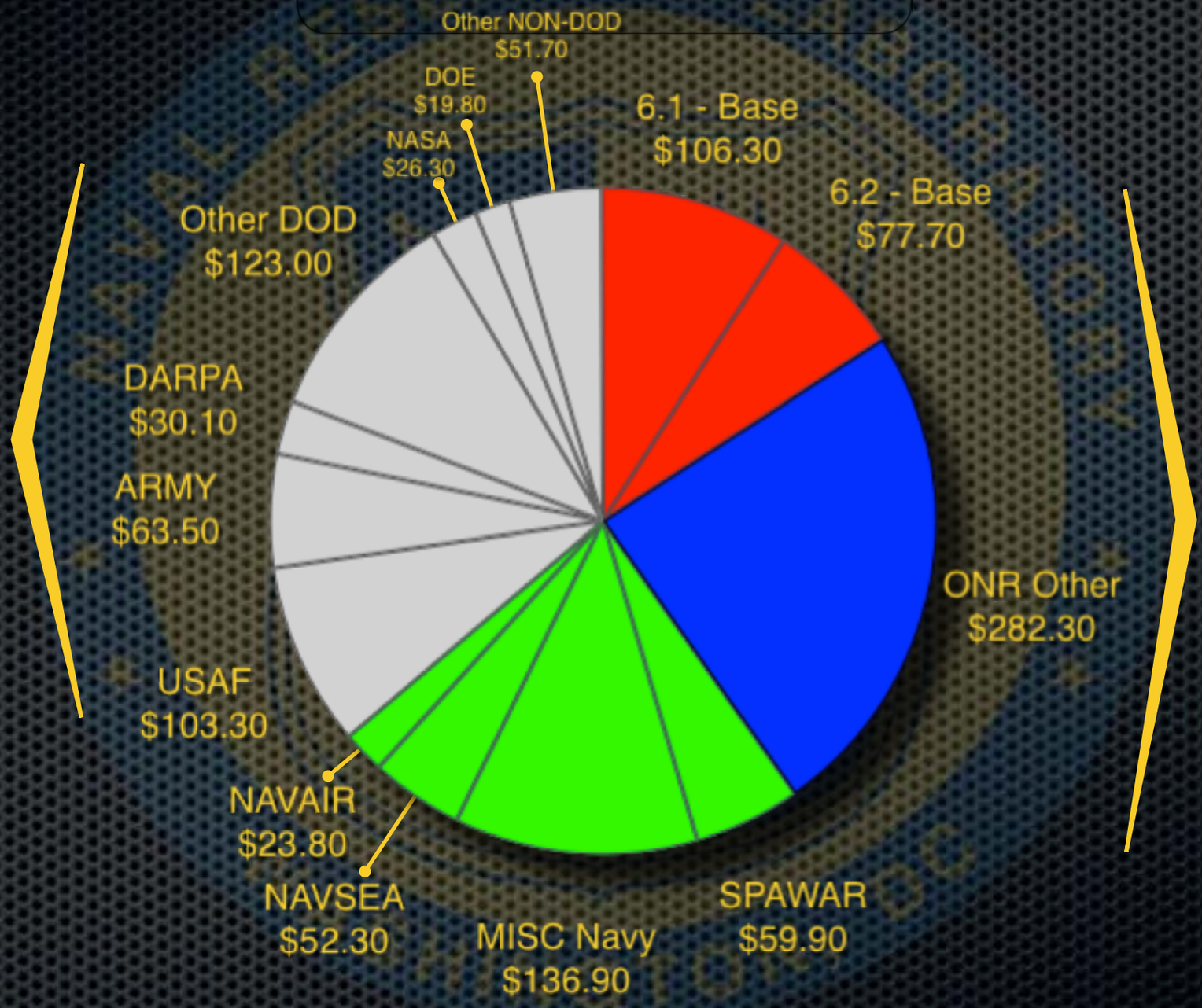
Scientific Development Squadron ONE (VXS-1)

Provides airborne research capability to NRL-Sensor and system test bed, airborne surrogate-Worldwide deployable

The Navy and Marine Corps Corporate Laboratory

SPONSORS

FY09
Income$1,183.9
Million



Leveraging Joint funding for Navy needs

Navy Funding for Navy needs

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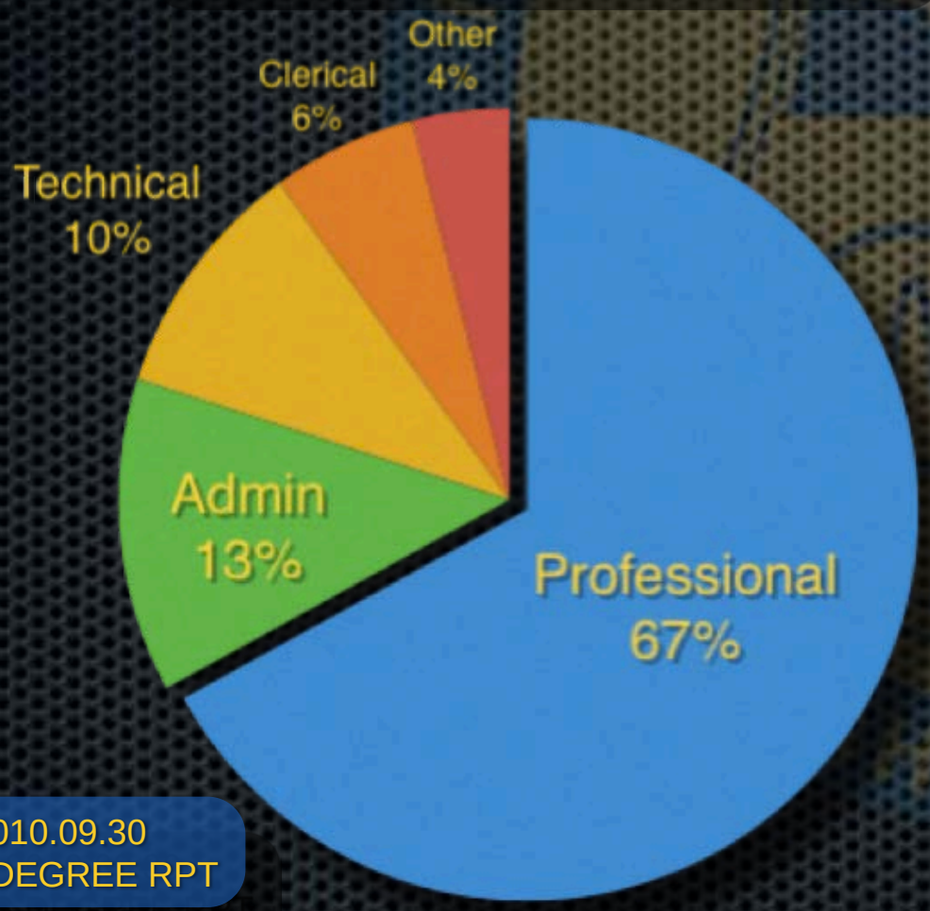
NRL Personnel FY 09
(Full Time Personnel)

Bachelor	511
Masters	331
Doctorate	756
Total (including WG)	2217



Physicists	374
Electrical Engineers	374
Computer Scientists	130
Other Engineers	93
Chemists	93
Mechanical Engineers	62
Aerospace Engineers	53
Oceanographers	53
Meteorologists	51
General Physical Scientists	41
Astronomers	33
Mathematicians	25
Biological Scientists	20
Metallurgists	10
*Other	31
Scientists/Engineers:	1443

* other includes: Geologists, Operations Research Analysts, Health Physicists

2010.09.30
CEIS DEGREE RPT

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National Academy Membership, 2009

	ANL	BNL	JPL	LANL	LLNL	IBM	NIST	NRL
NAE	3	2	6	4	3	17	10	7
NAS	3	9	0	5	0	11	5	3

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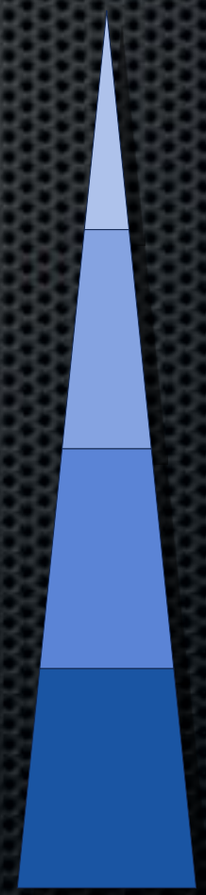
NRL Partnerships

- Partnerships with Industry
  - Cooperative Research and Development Agreements (CRADA)
  - Sale to Third Parties (non-Federal Government)
  - Licensing/Sublicensing
- Partnerships with Universities
  - @1000 collaborations with 250 institutions in 50 states
  - 198 collaborations in 34 foreign countries
- International Agreements/Committees
  - Involvement with 44 nations
- Joint Programs
  - MOA/MOUs

Primary Mechanisms for Tech Transfer

- Non Disclosure Agreements
- Material Transfer Agreements
- Co-operative Research and Development Agreements (CRADAs)
- Patent Licenses



Measures of S&T Excellence

Great Science, Right Science, Payoff for the Navy

World Class Science

- Papers, patents, citations, royalties
- Nat'l Academy members, society fellows
- Percent of staff with PhD/advanced degrees
- Prestigious scientific and engineering awards

High Value for DoN

- Transitions & quick responses
- BRAC military value rankings
- Studies by DSB, NDU, NRAC, NAS, etc
- Outside customers

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World Class Science

(Linkage between U.S. Scientific Research & Patents)

Top Ten (of 430) U.S. Institutions in Rank Order

(an NSF Study Research Policy)

Physics Papers
1. AT&T Bell Labs
2. IBM Corporation
3. Stanford University
4. Bellcore
5. Naval Research Laboratory
6. Lincoln Labs
7. MIT
8. University of Illinois
9. UC Santa Barbara
10. Cornell University

Engineering & Technical Papers
1. AT&T Bell Labs
2. IBM Corporation
3. University of CA Berkeley
4. MIT
5. Stanford University
6. General Electric Company
7. Texas Instruments
8. Naval Research Laboratory
9. UC Santa Barbara
10. Bellcore

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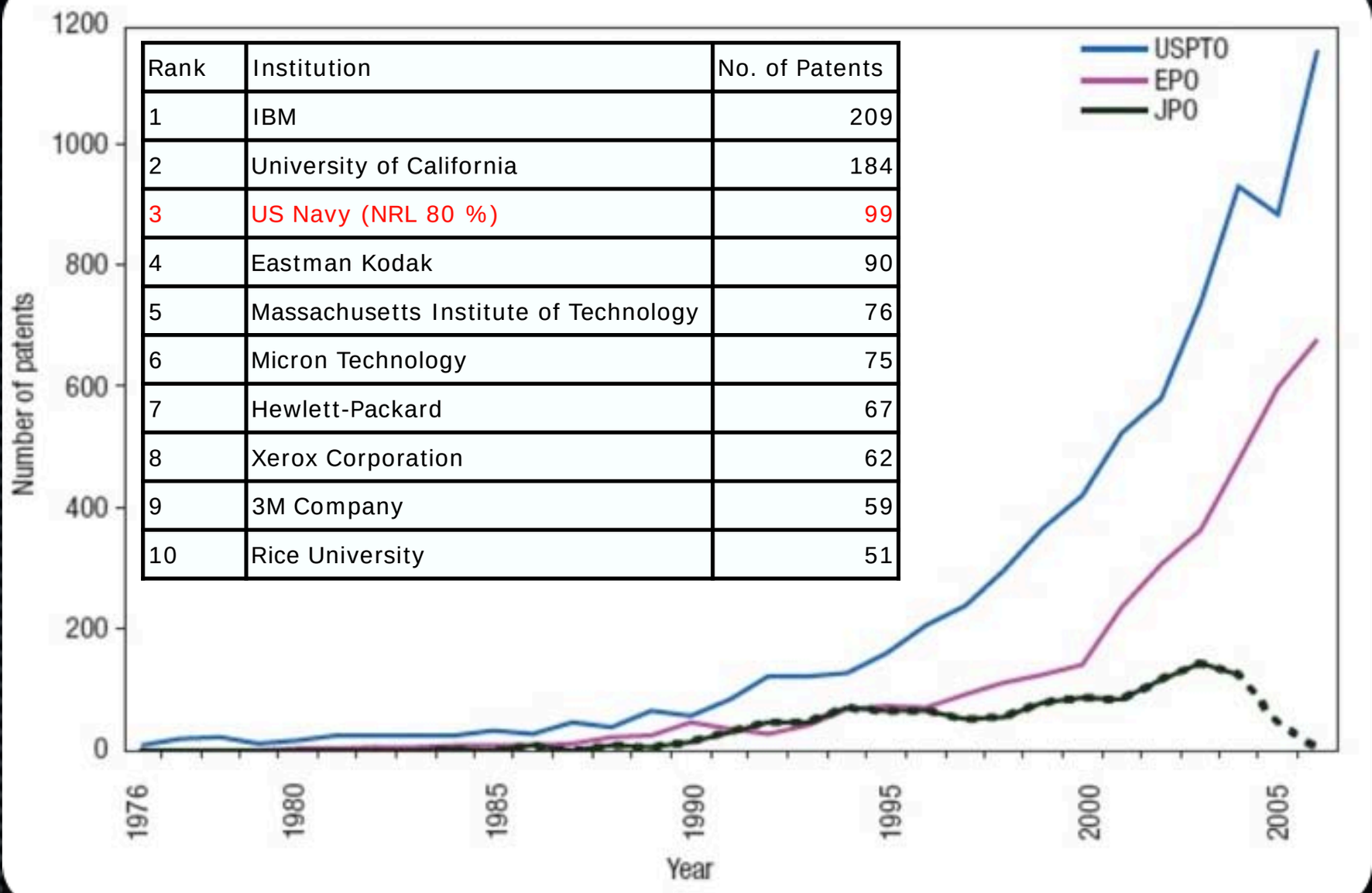
Rank	Institution	No. of Patents
1	IBM	209
2	University of California	184
3	US Navy (NRL 80 %)	99
4	Eastman Kodak	90
5	Massachusetts Institute of Technology	76
6	Micron Technology	75
7	Hewlett-Packard	67
8	Xerox Corporation	62
9	3M Company	59
10	Rice University	51



Top Ten Institutions for US Patents in Nanotechnology (1976-2006)
Nature Nanotechnology, Vol. 3, March 2008

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Cover Highlights in S&T Journals

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NRL Commissioned
1923

First radar installed on USS New York
1939

Principles of modern fracture mechanics
1947

Vanguard I launched
1958

First U.S. intelligence satellite
1960

Sound Navigation and Ranging (SONAR)

Plan-Position Indicator

Liquid Thermal Diffusion Process

Synthetic lubricants

Improved Aircraft Canopy

Deep Ocean Search

1920 1930 1940 1950 1960

Gamma-Ray Radiography

First U.S. radar patents

Submarine, airborne & OTH radars & IFF

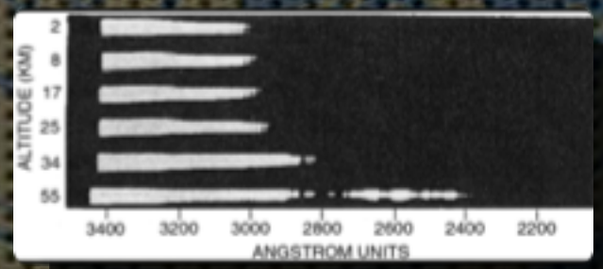
First Detection of X-Rays from the Sun

submarine life support

Over the Horizon Radar

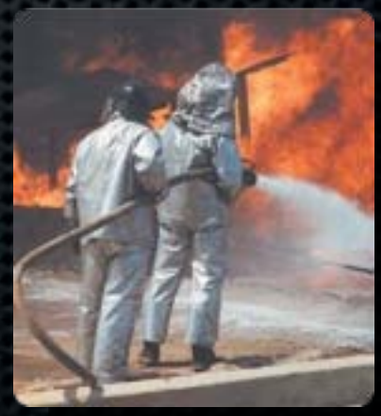
Skip distance effect
1925-1926

First concept & proposal for nuclear sub
1939



First experiment in space
1946

Purple K Powder
1959



Aqueous Film Forming Foam
1966

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First fiber-optic acoustic biosensor 1977

Permanent Magnets 1980

Nobel Prize in Chemistry to Jerome Karle 1985

Decadal Impact of El Nino discovered 1994

SHARP Reconnaissance 2001

Dragon Eye UAV 2002

Lunar camera

Excimer laser

Advanced Narrowband Secure Voice Terminal

Extreme Ultraviolet Imagine Telescope

CBR sensors for Fleet & Homeland Security

ANDE-2 Spacecraft

1970 1980 1990 2000 2010

GPS prototype in orbit

(GaAs) production techniques

Blood Surrogate

IPsec, IPv6, NKDS

Specific Emitter ID

Intrinsic Magnetism at Silicon Surfaces

Timation - GPS 1964-1977

Navy Operational Global Atmospheric Model 1982

NQR detection for explosives & narcotics 1992

Clementine Spacecraft 1991-1994

WindSat Spacecraft 2003

QuadGard 2005

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